

[This Drawing is a reproduction of the Original on a reduced scale.]

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PATENT SPECIFICATION



Application Date: May 12, 1942. No. 6422/42.

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Complete Specification Left: June 11, 1943.

Complete Specification Accepted: Nov. 5, 1943.

PROVISIONAL SPECIFICATION

Improvements in and relating to Gas Burner Jets

We, ASCOT GAS WATER HEATERS LIMITED, a British Company, of Ascot Works, North Circular Road, Neasden, London, N.W.10, and LEOPOLD FRIEDMAN, a British subject, of the Company's address, do hereby declare the nature of this invention to be as follows:—

This invention relates to gas burner jets.

10 In existing designs of both aerated and luminous gas burner jets trouble frequently arises owing to the blocking of the small jet holes, chiefly by gum deposit from the gas. Further the usual 15 steatite or like burner tip is liable to be broken as it projects considerably beyond the metal part of the burner.

The chief objects of the invention are to provide an improved construction of 20 gas burner jet in which the above disadvantages are obviated.

According to the invention in a gas burner jet the usual steatite or like burner tip is shielded by a metal casing. The 25 metal casing or shield may be formed as an integral part of the jet or be formed separately and secured in any suitable manner.

Further, in the case of an aerated 30 burner, according to the invention, the aeration holes in the tip are inclined at an acute angle to the flame orifice instead of at right angles thereto as is the usual practice at present. In the usual construction of burner with the aeration holes at right angles to the flame orifice, if the latter should become blocked the 35 gas burns at the aeration holes and the flames spread laterally and may damage adjacent components. If, however, the 40 aeration holes are inclined as indicated, the flames are at an acute angle with regard to the blocked orifice and the chance of damage is minimised.

45 Further the inclination of the aeration holes produces an increased turbulence in the mixing chamber within the burner and better combustion results.

Again, in existing types of burner jets 50 a sudden contraction of cross-sectional area occurs at the point where the gas supply passage-way terminates and the small jet hole commences. Through the

consequent sudden increase in velocity the gas is caused to impinge on the edge 55 of the small jet hole and as a result gum or other foreign matter in the gas collects round the edge and in time the jet hole may become blocked or partially so.

According to the invention the burner tip is provided with a gas passage-way which gradually decreases in cross-sectional area from the burner supply passage to the small jet hole. The 65 gradual decrease may be made by a radius or any suitable form of tapering may be adopted. For example, the gas passage-way in the burner tip may be so formed that its longitudinal section is 70 conical with slightly convex sides. A passage-way of such a shape will allow a considerable amount of material to collect upon its walls before the operation of the burner is interfered with.

Further, according to the invention, an annular recess may be provided around the small jet hole in the interior of the burner tip to collect any deposit or any dust or the like which may fall through 80 the flame orifice in the burner tip and so prevent it from blocking the small jet hole. A gum and dust trap may also be provided in the burner below the tip. Such a trap may be a gauze filter or a 85 perforated baffle plate or a combination of both suitably secured in the gas passage-way of the burner immediately below the tip thereof.

Thus a burner tip according to the invention may comprise a body of steatite or the like encased or sheathed in metal with any aeration holes and the flame orifice exposed, aeration holes if required being arranged at an acute angle to the 95 flame orifice, an annular recess around the small jet hole in the interior of the tip and a gas passage-way from the gas supply passage of the burner to the small jet hole which decreases in cross-sectional 100 area gradually.

The burner tip so formed may be applied to any usual type of burner jet but if desired the tip may be formed integrally with a steatite or like burner, 105 the burner then being sheathed with

metal so that the flame orifice of the tip is exposed.

Multi-jet burners may be constructed in this manner, for example an annular 5 burner tube of steatite or the like may have a number of steatite burner jet tips shaped according to the invention formed integrally therewith, the whole then being metal sheathed except for the 10 flame orifices.

Or a multi-jet burner of steatite or the like may be built up in sections to form a burner of any desired shape and metal sheathed as before mentioned.

Dated this 12th day of May, 1942.

ABEL & IMRAY,
Agents for the Applicants,
Quality House, Quality Court,
Chancery Lane, London, W.C.2.

COMPLETE SPECIFICATION

Improvements in and relating to Gas Burner Jets

15 We, ASCOT GAS WATER HEATERS LIMITED, a British Company, of Ascot Works, North Circular Road, Neasden, London, N.W.10, and LEOPOLD FRIEDMAN, a British subject, of the Company's 20 address, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

25 This invention relates to gas burner jets.

In existing designs of both aerated and luminous gas burner jets trouble frequently arises owing to the blocking of 30 the small jet holes, chiefly by gum deposit from the gas. Further the usual steatite or like burner tip is liable to be broken as it projects considerably beyond the metal part of the burner.

35 The chief objects of the invention are to provide an improved construction of gas burner jet in which the above disadvantages are obviated.

According to the present invention a 40 gas burner jet has a steatite or like burner tip shielded by a metal casing, the burner tip being provided with one or more aeration holes inclined at an acute angle to the flame orifice in the tip and opening 45 to the atmosphere adjacent to the flame orifice. In the usual construction of burner with the aeration holes at right angles to the flame orifice, if the latter should become blocked the gas burns at 50 the aeration holes and the flames spread laterally and may damage adjacent components. If, however, the aeration holes are inclined as indicated, the flames are at an acute angle with regard to the 55 blocked orifice and the chance of damage is minimised.

Further the inclination of the aeration holes produces an increased turbulence in the mixing chamber within the 60 burner and better combustion results.

Again, in existing types of burner jets a sudden contraction of cross-sectional area occurs at the point where the gas

supply passage-way terminates and the small jet hole commences. Through the 65 consequent sudden increase in velocity the gas is caused to impinge on the edge of the small jet hole and as a result gum or other foreign matter in the gas collects round the edge and in time the jet hole 70 may become blocked or partially so.

The burner tip is provided with a gas passage-way which gradually decreases in cross-sectional area from the burner supply passage to the small jet hole. The 75 gradual decrease may be made by a radius or any suitable form of tapering may be adopted. For example, the gas passage-way in the burner tip may be so formed that its longitudinal section is conical 80 with slightly convex sides. A passage-way of such a shape will allow a considerable amount of material to collect upon its walls before the operation of the 85 burner is interfered with.

Further, an annular recess may be provided around the small jet hole in the interior of the burner tip to collect any deposit or any dust or the like which may fall through the flame orifice in the 90 burner tip and so prevent it from blocking the small jet hole. A gum and dust trap may also be provided in the burner below the tip. Such a trap may be a gauze filter or a perforated baffle plate or 95 a combination of both suitably secured in the gas passage-way of the burner immediately below the tip thereof.

To enable the invention to be fully understood it will now be described by 100 reference to the accompanying drawings, in which:—

Fig. 1 is a sectional elevation of a burner jet constructed according to one 105 form of the invention, and

Figs. 2 and 3 are sectional elevations of burner jets fitted with filters or baffles according to the invention, and

Figs. 4, 5 and 6 are detail views of the 110 filters and baffles which may be used,

Fig. 7 is a part sectional elevation of part of an annular multi-jet burner con-

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structed according to one form of the invention.

As shewn in Fig. 1 the burner jet 9 has a burner tip 15 of steatite or the like 5 having a flame orifice 16 and aeration holes 17 arranged at an acute angle to the flame orifice and opening to the atmosphere adjacent thereto. The tip is protected by a metal sheath 18 formed integrally with the jet 9, the orifice 16 and the holes 17 being exposed. Further, the interior of the tip 16 is provided with a mixing chamber 19 into which a tapered gas passage 20 opens through a small jet 15 orifice 21 situated below the flame orifice 16. The gas passageway 20 decreases in cross-sectional area gradually. In this case the gradual decrease of the passageway 20 is effected by shaping the interior wall on a curve or radius 14 as shewn but any other suitable form of tapering towards the flame orifice may be adopted. A passageway shaped as described will allow a considerable amount of material 25 to collect upon its walls before the operation of the burner is interfered with. An annular recess 22 is provided round the jet orifice 21 to collect dust or products falling through the orifice 16 thus assisting in preventing the blocking of the orifice 21.

The inclination of the aeration holes 17 increases the turbulence in the mixing chamber 19 and causes the gas flames to 35 project at an acute angle in the event of the flame orifice becoming blocked as hereinbefore mentioned, thus minimising the chance of damage to adjacent components.

40 Figs. 2 and 3 shew burner jets similar to that shewn in Fig. 1 but further improved by the provision of gum and dust traps below the burner tips.

In Fig. 2 the trap comprises a circular filter 23 of gauze arranged below a perforated baffle in a recess below the tip 15.

Fig. 5 is a plan view of a suitable gauze filter 23 having a central baffle 24 and Fig. 4 shews a suitable gauze filter 25 50 without a baffle.

Fig. 3 shews a burner jet in which the trap comprises a baffle 26 arranged in a recess below the tip 15. The baffle is shewn in plan view in Fig. 6 and is in 55 the form of a cross 26 the ends 27 of the arms being turned up. Any suitable form of filter or baffle, or a combination of both may be used as will be understood. Burner tips formed as herein-

60 before described may be applied to any usual type of burner jet but if desired the tip may be formed integrally with a steatite or like burner, the burner then being sheathed with metal so that the 65 flame orifice and any aeration holes in the

tip are exposed. Multi-jet burners may be constructed in this manner and an example is shewn in Fig. 7. Referring to Fig. 7, an annular burner tube 28 of steatite or the like is provided with a series of burner tips 29, each constructed according to the invention and formed integrally with the tube. The burner tube 28 is then enclosed in a two-part metal casing 30 arranged to sheath the 75 whole in metal but leaving the burner tips 29 and their orifices exposed as clearly shewn. Or a multi-jet burner of steatite or the like may be built up in sections to form a burner of any desired 80 shape and metal sheathed as before mentioned.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to 85 be performed, we declare that what we claim is:—

1. A gas burner jet having a steatite or like burner tip shielded by a metal casing, wherein the burner tip is provided with one or more aeration holes inclined 90 at an acute angle to the flame orifice in the tip and opening to the atmosphere adjacent to the flame orifice.

2. A gas burner jet according to claim 1 wherein the burner tip is provided with a gas passageway which gradually decreases in cross-sectional area from the burner supply passage to the small jet 100 hole for the purpose described.

3. A gas burner jet according to claim 2 wherein the gradual decrease in cross-sectional area of the gas passageway in the burner tip is effected by a curve or radius or any suitable form of tapering 105 of the interior wall of the passageway.

4. A gas burner jet according to claim 3 wherein the gas passageway in the burner tip is so formed that its longitudinal section is conical with slightly 110 convex sides.

5. A gas burner jet according to any one of the preceding claims wherein a mixing chamber is provided in the burner tip below the flame orifice thereof the gas 115 entering through a gas passageway of decreasing cross-sectional area terminating in a small jet hole below the flame orifice.

6. A gas burner jet according to claim 5 wherein an annular recess is provided round the small jet hole in the interior of the burner tip for the purpose referred to.

7. A gas burner jet according to claim 5 or 6 wherein a gum or dust trap is provided in the burner below the tip, said trap comprising a gauze filter or a perforated baffle plate or a combination of both suitably secured in the gas passage- 130

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way of the burner immediately below the burner tip.

8. A multi-jet gas burner comprising a steatite or like burner tube having a number of steatite burner jet tips shaped and provided with inclined aeration holes according to any one of the preceding claims formed integrally therewith, the whole then being sheathed in metal leaving the flame orifices and aeration holes in the burner tips exposed.

9. Gas burner jets having burner tips

constructed substantially as hereinbefore described with reference to Figs. 1 and 6 inclusive of the accompanying drawings.

10. Multi-jet gas burners constructed substantially as hereinbefore described with reference to Fig. 7 of the accompanying drawings.

Dated this 11th day of June, 1943.

ABEL & IMRAY,
Agents for the Applicants,
Quality House, Quality Court,
Chancery Lane, London, W.C.2.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1943.